LizardTech™

Plug-in for ArcGIS

User Guide

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Introduction

Thank you for using LizardTech software and welcome to the documentation for the LizardTech Plug-in for ArcGIS.

The LizardTech Plugin for ArcGIS allows easy and efficient interoperability between ArcGIS products and LizardTech Express Server and Spatial Express. It enables ArcGIS users to:

- Add MrSID, JPEG 2000 and NITF images from Express Server into your ArcMap documents
- Add MrSID and JPEG 2000 images from Oracle Spatial into your ArcMap documents
- Serve MrSID, JPEG 2000 and NITF images from Express Server via ArcGIS Image Server (AIS)

System Requirements

The LizardTech Plug-in for ArcGIS requires the following system components:

- One of the following operating systems:
  - Microsoft Windows 2000, SP4
  - Microsoft Windows XP, SP2
  - Microsoft Windows 2003, SP1
  - Microsoft Windows Vista
- 1.5+ GHz Intel Pentium-4 Processor (2.6+ GHz recommended)
- 256 MB RAM
- ArcGIS 8.x, or 9.x (for adding images from Express Server to ArcMap documents). **Note:** For adding images from Oracle Spatial on Vista, ArcGIS 9.3 is required.

The following additional components are required for adding images from Oracle Spatial to ArcMap documents.

- Oracle 10gR2 Enterprise Edition with the Spatial Option (local or remote)
- Spatial Express

NOTE: The LizardTech Plug-in for ArcGIS supports U.S. English only.

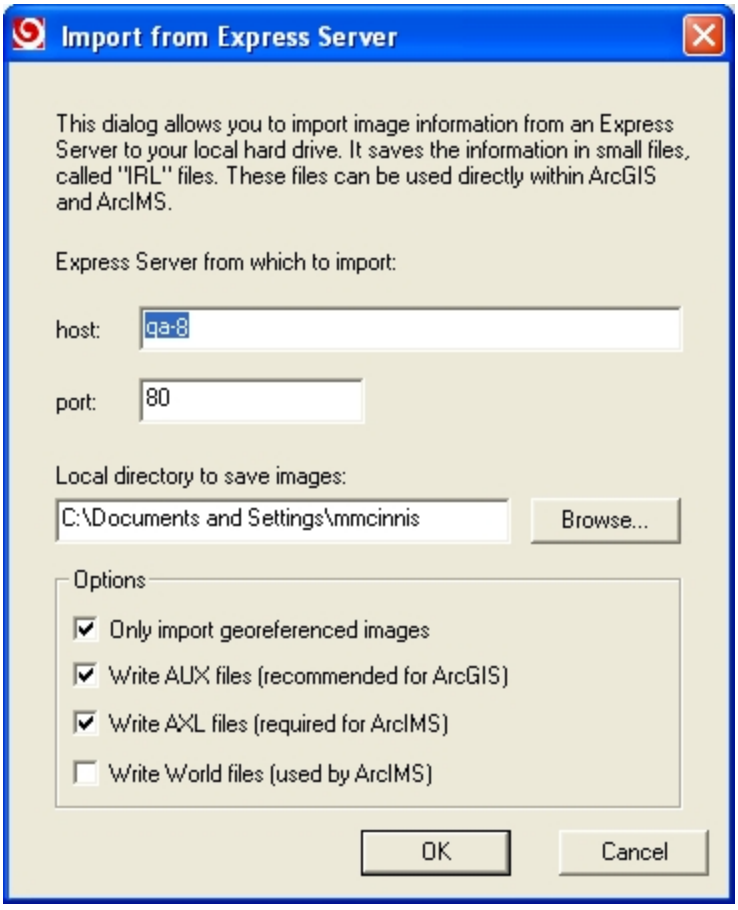
Importing Images from Express Server into ArcMap or ArcGIS Image Server

Before you add images catalogued in an Express Server to either ArcGIS Image Server (AIS) or Arcmap, you must "import" those images. Importing an image really means creating an IRL file, a local file which *represents* that image (the image itself is very large, and stays in its original location – see "About IRL Files" on page 15). This is quickly and easily accomplished using the IRLFetch application.

The IRLFetch utility explores an Express Server site and produces a local directory tree containing references (IRL files) to the images published there.

To create and import IRL files for Express Server imagery:

1. Choose **Start > Programs > LizardTech > Express Server Plugin for ArcGIS > Import from Express Server**. The IRLFetch utility appears as shown below:


Import from Express Server
This dialog allows you to import image information from an Express Server to your local hard drive. It saves the information in small files, called "IRL" files. These files can be used directly within ArcGIS and ArcIMS.
Express Server from which to import:
host:
qa-8
port:
80
Local directory to save images:
C:\Documents and Settings\mmcinnis
Browse...
Options
Only import georeferenced images
Write AUX files (recommended for ArcGIS)
Write AXL files (required for ArcIMS)
Write World files (used by ArcIMS)
OK
Cancel

2. Enter the host and port of the Express Server which is hosting the images that you wish to work with.
3. Browse for or enter the path to the directory you wish to save the imported images in.

4. It is not necessary to generate world files or AXL files for ArcGIS. However, it is highly recommended that you select the **Write AUX files** checkbox, as these files contain positioning and spatial reference information necessary for more consistent behavior in some ArcGIS versions.
5. Click **OK**.

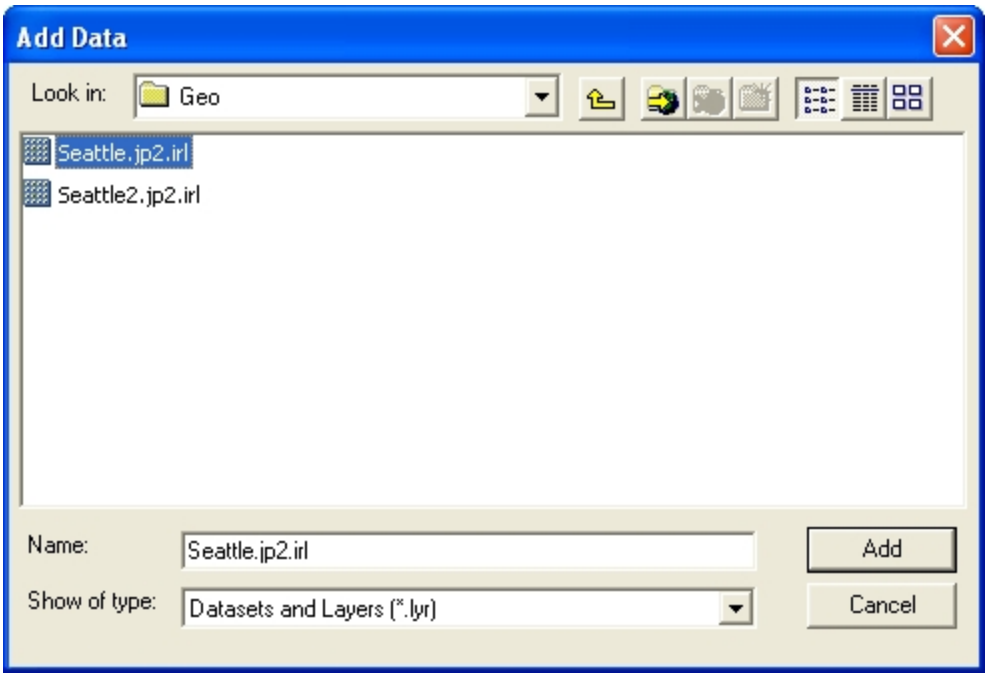
Once you've imported all the IRL files, you can add them to ArcMap documents or AIS Service definitions. (See your ArcGIS documentation for further information.)

NOTE: IRL files based on "NITF Raw" images published on Express Server may be displayed stretched on the X axis. This can be corrected on the server side by using world files to position the NITF tiles.

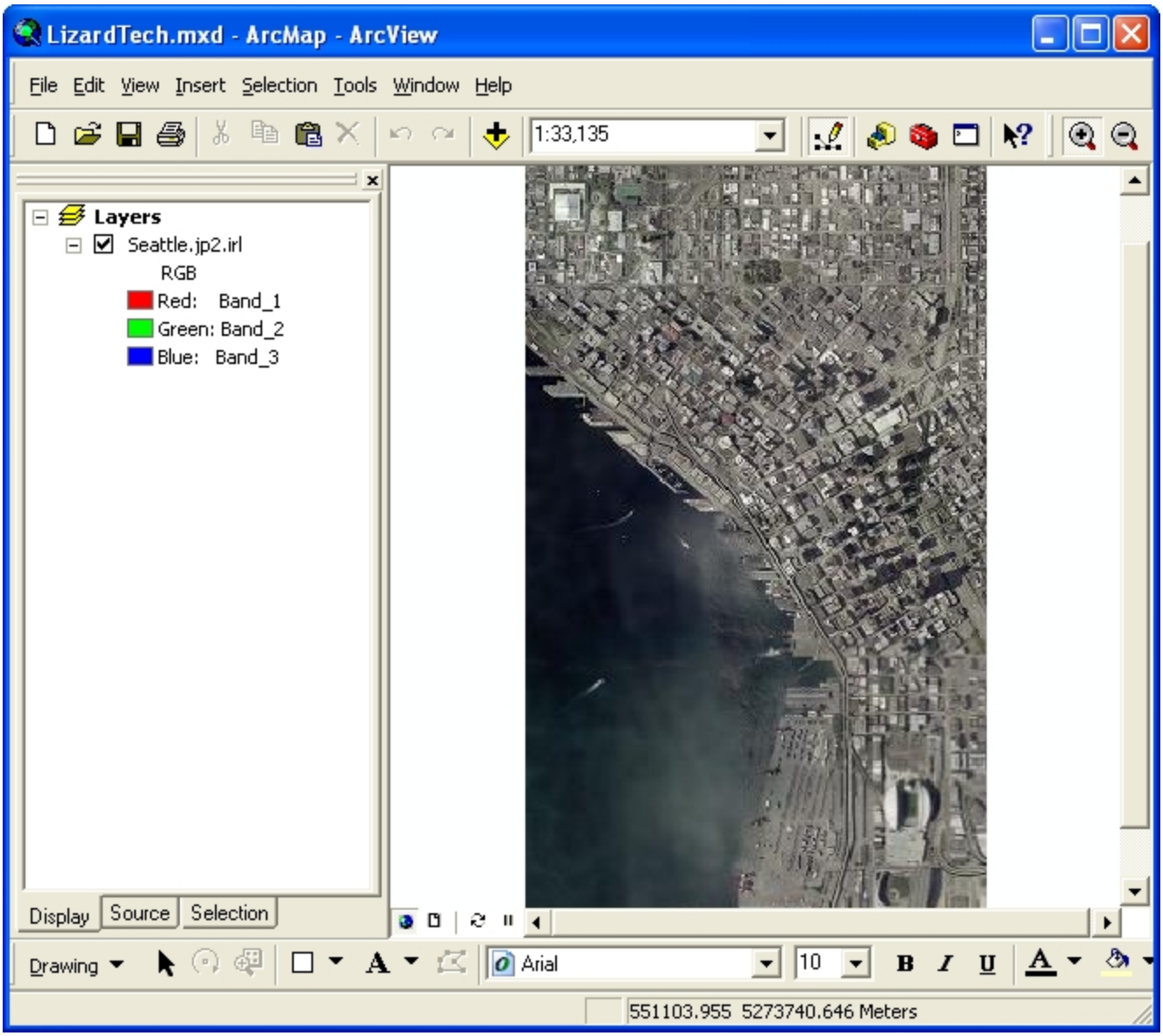
Adding Images to an ArcMap Document

To add images to an ArcMap document:

1. Start ArcMap .
2. Create a new project, or open an existing one.
3. Click on the "+" button to add an image to your document. The Add Data dialog appears as shown below.



4. Browse to the directory where you imported your Express Server images, and select the image you wish to add.
5. Click **Add**, and ArcMap will draw your image.



Troubleshooting

1. If ArcGIS reports "Invalid Raster Format" when viewing an Express Server image, it is most likely due to one of the following:
   A. There has been a communication error with the Express Server. Verify that the Express Server is running and accessible from your computer (http://<server-ip>:<port>/lizardtech/iserv/browse?style=none).
   B. The image has been removed or renamed on the Express Server. In this case, you should delete the directory containing the IRL files for that server, and run IRLFetch again (see "Importing Images from Express Server into ArcMap or ArcGIS Image Server" on page 6).

C. Some other software was installed that unregistered the DLLs required to run the Lizard-Tech Plug-in for ArcGIS. In this case, the best thing to do is to uninstall and reinstall the plug-in.

2. If you define an environment variable `LT_ARCGIS_LOGFILE` to be a path to a file, then the plug-in will generate diagnostic information in the file which will be helpful for troubleshooting. For example, executing the following commands in the Windows command shell would record log information in the file `C:\irlRaster.log`:

```
E:> set LT_ARCGIS_LOGFILE=C:\irlRaster.log
E:> E:\Program Files\ArcGIS\Bin\ArcMap.exe
```

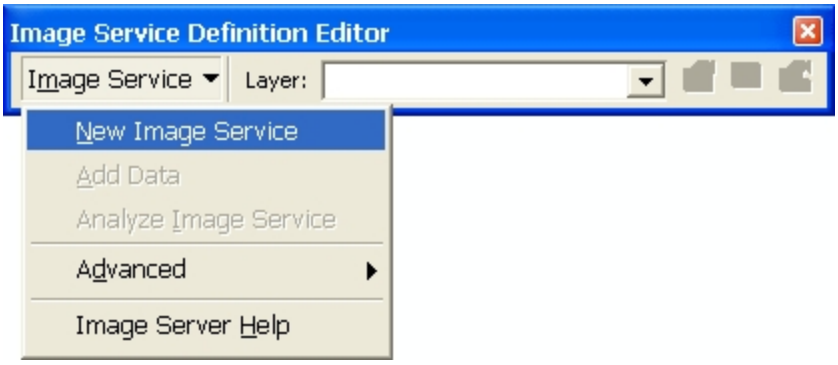
Adding Images to an AIS Image Service

All ArcGIS Images Server (AIS) image services are created in ArcMap using the Image Service Definition Editor.

NOTE: The Image Service Definition Editor is part of ESRI's Image Service Extension, which is part of ArcGIS Image Server (not ArcMap) but which must be installed on an existing ArcMap installation. See ESRI's documentation for more information.

To create a new image service:

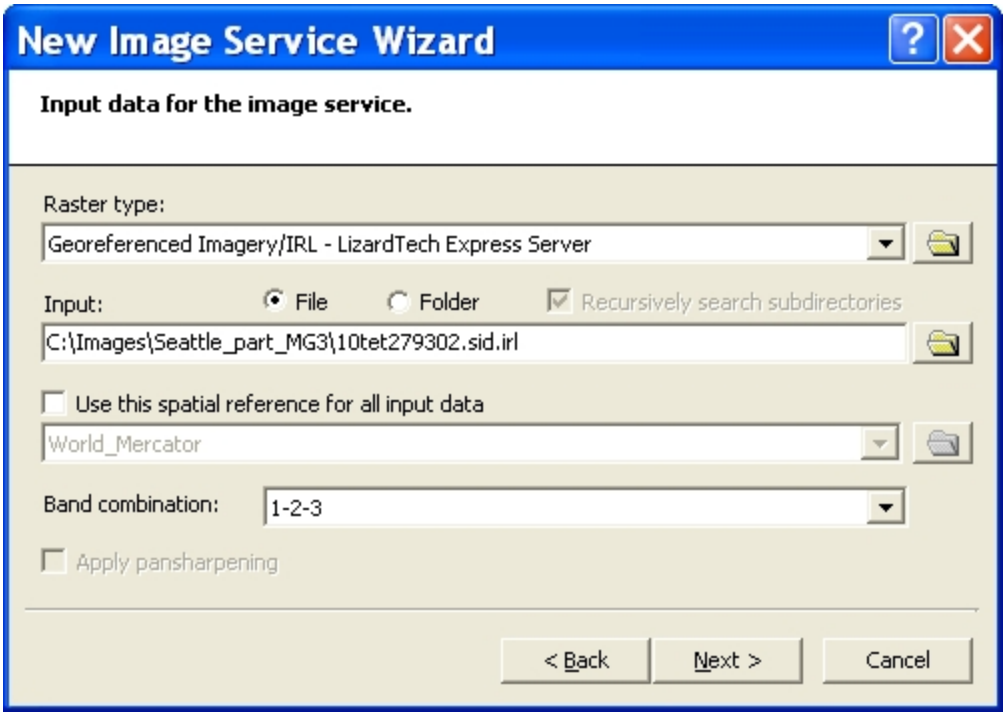
1. In the **Image Service Definition Editor**, choose **New Image Service** from the **Image Service** menu as shown below.



   The New Image Service Wizard starts. This wizard will guide you through the service creation process.

2. In order to base your service on the Express Server images, pick the IRL file(s) corresponding to those images. You must specify a Raster Type of "IRL" as shown below. For information about the other fields in this wizard, see the topic "About the New Image Service Wizard

parameters" in the Help for ESRI's ArcGIS Image Server.



The output of the wizard is a compiled service definition in an .ISCDEF file that you can add to AIS using ESRI's Image Server Manager application. ESRI's AIS's Help topic "Publishing image services with the Image Server Manager" contains more information about this application.

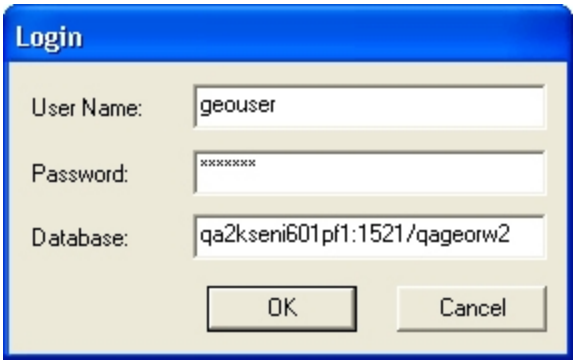
Importing Images from Oracle Spatial into ArcMap

The LizardTech Plug-in for ArcGIS enables users to import image data from an Oracle database into their ArcView application. With the plug-in, ArcMap users can click a button on the ArcMap toolbar to browse Oracle Spatial tables and choose one or more MrSID (SID) or JPEG 2000 (JP2) GeoRaster images to add to their maps.

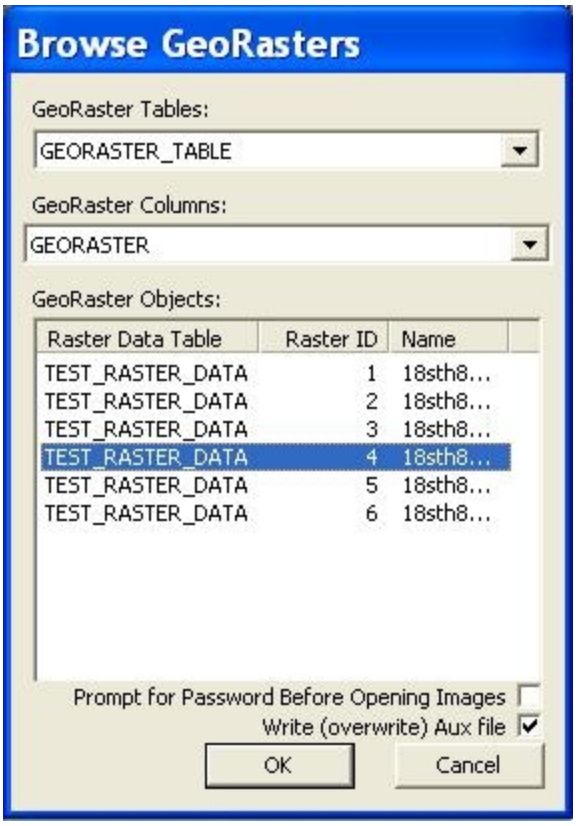
Importing imagery from a database for use in ArcMap involves connecting to a server and specifying the GeoRaster table and column from which you wish to import an image, and the image's raster ID.

To connect to an Oracle database and select an image:

1. Click the **Add Spatial Express Data** button on the ArcMap toolbar. (If you have not yet added this button, see "Adding the 'Add Spatial Express Data' Button to the ArcMap Toolbar" on page 14). The Login dialog box appears as shown below.



2. Enter the username, password and database and click **OK**. The Browse GeoRasters dialog box appears as shown below.



3. Select a GeoRaster table and GeoRaster column from the drop-down menus. The GeoRaster Objects field is populated with a list of available GeoRaster images from the specified column, sorted by Raster ID. Info for each listed item includes its Raster Data Table and any associated descriptive name. (**Note:** Only JP2 and SID GeoRaster images are listed. Images in other compression formats, including "NONE", are not shown.)
4. Select one or more GeoRaster images from the GeoRaster Objects list.
5. Optionally, select the **Prompt for Password Before Opening Images** checkbox. With this option the password is not stored locally, which means the user must supply it each time the map is opened (see "About IRL Files" on page 15). By default this checkbox is not selected.
6. Also, note that the "Write (overwrite) Aux file" check box is selected by default. Unless you encounter specific reasons to disable this, LizardTech recommends you leave this option enabled. This improves interoperability with some versions of ArcGIS.
7. Click **OK**.

Adding the 'Add Spatial Express Data' Button to the ArcMap Toolbar

The LizardTech Plug-in for ArcGIS includes an extension that enables you to import images from Spatial Express.

Before being able to use the “Add Spatial Express Data” extension to ArcMap, you must add a button for the plug-in functionality to your ArcMap toolbar. This is very easy to do; once you install the plug-in the "Add Spatial Express Data" functionality already exists as a custom command. All you have to do is select it and drag it onto your toolbar to create a button.

To add the button to your toolbar in ArcMap:

1. From the **Tools** menu select **Customize...**. The **Customize** dialog box appears.
2. Select the **Commands** tab.
3. From the **Categories** list on the left select **File**. A list of available commands appears on the right.
4. Click on the **Add Spatial Express Data** command and drag it to the desired location in your toolbar.
5. Click **Close**.

About IRL Files

NOTE: The following discussion assumes a context of Oracle Spatial images being accessed via Spatial Express, but IRL files are also used by Express Server.

When you select a GeoRaster image to add to your map, an IRL file is written locally to a pre-configured directory. If you select more than one GeoRaster image, an IRL file is created for each one. The IRL file contains the connection information and the identifying Raster Data Table/Raster ID key for the selected GeoRaster in the Oracle database. To avoid filename collision, each file is also named using a combination of the database connect identifier, the Raster ID and the Raster Data Table. IRL files are written to a folder in the current user's Application Data directory. This folder is not configurable.

Once the IRL file is created, it is added to your map. The image is then rendered by the Raster Data Object component, which is called upon by the ArcObjects framework to position and provide pixels for Spatial Express images referenced in IRL files.

If the password for a GeoRaster image is stored locally, users can later open the map without entering the password. By default the password is stored reversibly hashed so that it is not readable in plain text. If the password is not stored, users must supply the password each time they restart ArcMap and open the corresponding map. You may choose not to store the password locally by selecting the "Prompt for Password Before Opening Images" checkbox on the Browse GeoRasters dialog box (see "Importing Images from Oracle Spatial into ArcMap" above).

For more information see "Changing an Image's Background Color Via an IRL File" on page 16.

Changing an Image's Background Color Via an IRL File

You may change the background color of an image viewed in ArcGIS by opening the IRL file in a text editor and manually adding a background flag ("bg") along with the hexadecimal RGB code for the desired color.

For example, the following text from an IRL file specifies an Express Server, a catalog, and an image, but uses no background flag, so the image will be rendered with the default (black) background:

```
http://dem-
o.l-
izardtech.com:80/lizardtech/iserv/getimage?cat=Seattle&item=/iserv-
catalog-index
```

A blue background is specified by appending the background flag with the code for blue, as follows:

```
http://dem-
o.l-
izardtech.com:80/lizardtech/iserv/getimage?cat=Seattle&item=/iserv-
catalog-index&bg=0000ff
```

NOTE: Changing the IRL for an image does not change the original image data stored on an Express Server or Oracle Spatial database.

Appendix

About LizardTech and LizardTech Products

Since 1992, LizardTech has delivered state-of-the-art software products for managing and distributing massive, high-resolution digital content such as geospatial image data.

LizardTech pioneered MrSID® (Multiresolution Seamless Image Database), a powerful wavelet-based image encoder, viewer, and file format, and sits on the Technical Committee of the Open Geospatial Consortium (OGC) for the purpose of extending the capabilities of JPEG 2000 to geospatial applications, driving cross-platform interoperability and rapid Internet distribution for geospatial imagery.

LizardTech has offices in Seattle, London and Tokyo and is a division of Celartem Technology Inc., (Hercules: 4330). For more information about LizardTech, visit www.lizardtech.com.

Other LizardTech Products

We at LizardTech are glad to have you as a customer. While you're "in the shop," explore LizardTech's other great products for managing and distributing geospatial imagery. For instant notification of new LizardTech product releases and patches add the following link to your favorite RSS feed reader:

http://www.lizardtech.com/files/rss/updates.xml

GeoExpress

GeoExpress is the industry standard used by geospatial professionals to manipulate and compress raster image files for use in geospatial applications. GeoExpress offers the benefits of both MrSID technology and ISO standard JPEG 2000 without any compromise in image quality. In addition to lossless encoding, which preserves images with pixel-for-pixel fidelity in a compressed format easily reusable in downstream applications, GeoExpress provides valuable image manipulation tools such as cropping, mosaicking, reprojection from one coordinate reference system to another and color balancing.

Learn more about GeoExpress at http://www.lizardtech.com/products/geo.

Express Server

Express Server is a server application for rapidly distributing large datasets of raster imagery. With Express Server, users on any device over any connection access imagery faster. Express Server enables organizations to serve more users in less time using widely adopted standards and familiar tools – without adding hardware or bandwidth.

Learn more about Express Server at http://www.lizardtech.com/products/exp.

Spatial Express

Spatial Express is a set of command-line tools and a compression plug-in that together enable you to load georeferenced raster imagery into your Oracle Database 10gR2. Storing imagery as compressed

MrSID or JPEG 2000 imagery instantly reduces database storage requirements by as much as 95 percent and enables you to easily retrieve desired image scenes according to geospatial and other metadata.

Learn more about Spatial Express at http://www.lizardtech.com/products/spatial.

ExpressView Browser Plug-in

ExpressView Browser Plug-in (formerly MrSID Browser Plug-in) gives standard Windows and Mac Web browsers the ability to natively view MrSID and JPEG2000 images. The intuitive graphic user interface allows you to view, magnify, print and save images. ExpressView Browser Plug-in is free for individual use and is easily installed as a plug-in for Netscape®, Internet Explorer and Safari Web browsers.

Download this plug-in at http://www.lizardtech.com/download/dl_options.php?page=plugins.

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MODIS image dataset provided by Reto Stockli, NASA Earth Observatory, rstockli@climate.gsfc.nasa.gov

This code relies on a number of Open Source software packages, including but not limited to cppunit, crypto++, expat, GDAL, zlib, perl, gcc, cvs, OpenSSL, gSOAP, doxygen and Linux. LizardTech thanks the Open Source community for its efforts.

This product includes software developed by the Apache Software Foundation (http://www.apache.org/).

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